SPUDNIK

OUR WORLD IS POTATOES

# Field Guide

2007

# Low Cost Planter and Row Monitor Setup

Part # 290120

# Service Centers

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## Configuration and functions of the machine

**Method of operation of the machine**

The SPUDNIK planter is designed for planting potatoes.

This describes the configurations and functions

**Special safety instructions**

Safety devices

Never stand beneath suspended loads!

Never stand or work beneath suspended loads!

Engage safety catches!

Never stand or work beneath suspended loads.

Adjustment and maintenance work on parts of the machine may only be carried out with the safety devices engaged.

## Configuration and Functions of the Planter

**Row Spacing – 32”, 34”, 36”, 38”, 36-40”**

Move planting unit, hopper, top bin, extension, shoes, also the first and last row unit.

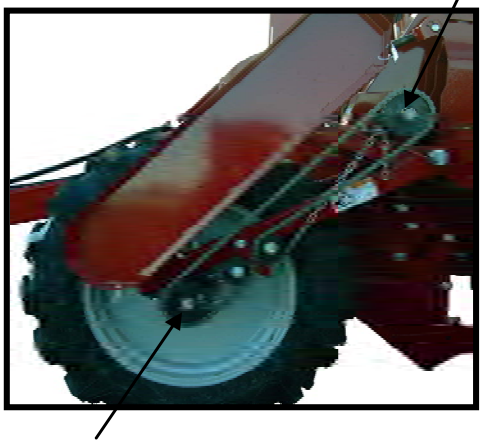
**Seed Spacing – 6-18”**

| SPUDNIK Sprockets | | Ideal Seed Spacing |
|---|---|---|
| Front | Rear | Seed Spacing (in.) |
| 28 | 15 | 6 |
| 25 | 15 | 6.5 |
| 24 | 15 | 7 |
| 23 | 15 | 7.5 |
| 21 | 15 | 8 |
| 24 | 18 | 8.5 |
| 25 | 21 | 9 |
| 21 | 23 | 9.5 |
| 26 | 23 | 10 |
| 25 | 23 | 10.5 |
| 26 | 25 | 11 |
| 24 | 25 | 11.5 |
| 23 | 25 | 12 |
| 22 | 24 | 12.5 |
| 21 | 24 | 13 |
| 18 | 15 | 13.5 |
| 18 | 22 | 14 |
| 18 | 23 | 14.5 |
| 18 | 24 | 15 |
| 18 | 25 | 15.5 |
| 15 | 21 | 16 |
| 15 | 22 | 16.5 |
| 15 | 23 | 17 |
| 18 | 28 | 17.5 |
| 15 | 24 | 18 |

| Inside Jack Shaft Sprocket and Cup Belt Information | | | |
|---|---|---|---|
| Part No. | Sprocket | Cup Size | Total # Cups |
| 881045 | 24 | Blue Cups Large | 30 |
| 881114 | 20 | Green Cups Medium | 36 |
| 881111 | 18 | Red Cups Small | 40 |

**Note:**
Drive wheel slip in the field will necessitate a change in sprocket size from the ideal listed in the chart above, to a slightly smaller sprocket. For example, if 10 percent slip is occuring, and a 10 inch spacing is desired, then a 25 tooth sprocket will need to be used on the rear instead of the 23 tooth sprocket listed in the chart

| Additional Quick-Change Sprockets | |
|---|---|
| Part # | No. Teeth |
| 881287 | 12 |
| 881288 | 13 |
| 881289 | 14 |
| 881290 | 15 |
| 881291 | 16 |
| 881292 | 17 |
| 881293 | 18 |
| 881294 | 19 |
| 881295 | 20 |
| 881296 | 21 |
| 881297 | 22 |
| 881298 | 23 |
| 881299 | 24 |
| 881300 | 25 |
| 881301 | 26 |
| 881302 | 27 |
| 881303 | 28 |



## Configuration and Functions of the Planter

**Note ! This page gives the key points of Planter Setup… It is recommended that you read this Guide further for an in-depth explanation of each point, before you begin Setup.**

**Planting Depth –**

Is adjusted depending how equipped, with the gage wheel (optional) on each pair of shoes, the Depth Wheels on the front of the Planter, or the Draw Bar

**Covering Discs –**

Are adjustable for angle, depth, and width.

**Tighten Idlers –**

Mechanical drive, and chemical box drives.

**Cup belt shaker –**

The rear side of the cup belt has two V-ledges. The movement of the V-ledges over the pressure rollers causes a vibrating motion. This vibration motion prevents dual seed allocations in the planting cups.

**Adjust vibration intensity –**

The intensity of the vibration movement can be adjusted using the lever on the side of each row unit. This adjustment is for intense individual shaker adjustments.

**Setting:**

-Loosens the star wheel on the side.

-Move lever until the desired vibration is met.

-Tighten wheel.

**Reducing the vibration intensity –**

If the lever is pushed up, the pressure rollers are moved away from the cup belt. The pressure Rollers exert less pressure against the V-ledges on the cup belt. The reduced contact pressure of the pressure rollers reduces the vibrating motion.

Fine adjustment is achieved using the star wheel on the top of the lever.

-turn to the right to increase

-turn to the left to decrease

**Increasing the vibration intensity –**

If the lever is pushed down, the pressure rollers are moved towards the cup belt. The pressure rollers exert more pressure against the V-ledges on the cup belt. The increased contact pressure of the pressure rollers increases the vibrating motion.

*The intensity of the vibrating movement must be adapted to the shape and size of the seed potatoes.

*When using the optional Hydraulic intensive vibrators, the level may be adjusted to regulate the vibrating intensity solely between the upper and lower step (E) of the crank. The steps (M) are exclusively meant to adjust the mechanical vibrations.

**Cup belt high-intensity shaker (optional) –**

The high-intensity shaker produces an enhanced vibrating motion. It is hydraulically driven. The intensity of the vibrating movement can be adjusted using the lever previously described. The vibration frequency can also be adjusted through the Tractor Remote Hydraulic Valve .

## Configuration and Functions of the Planter

**Seed Level in Bowl –**

If there is not adequate seed in the bowl, skips will result. Adjust the sensor on top of the bowl. The maximum seed level should be one inch below the top edge to the seed weight door at the rear. The bowl level should be observed while planting because the bowl may over fill when stopping or lifting the planter.

**Make sure the pin (1) on the stainless steel pan is all the way in so the pan vibrates to keep itself clean and seed feeds evenly.**

| Specifications | | | |
|---|---|---|---|
| **Model** | **8040** | **8060** | **8080** |
| **Weight:** | 9,000 lb. | 13,500 | 18,000 |
| **Hopper Capacity:** | 7,000 to 8,000 lb. | 11,000 to 12,000 lb. | 15,000 to 16,000 lb. |

**Speed of Feed Chains –**

Mechanical drive Planter is adjusted from the tractor remote Valve.

## Configuration and Functions of the Planter

### Row Unit Set-Up

To achieve the highest accuracy while planting it is important to have the row unit properly adjusted.

**Feed Chain Speed –**

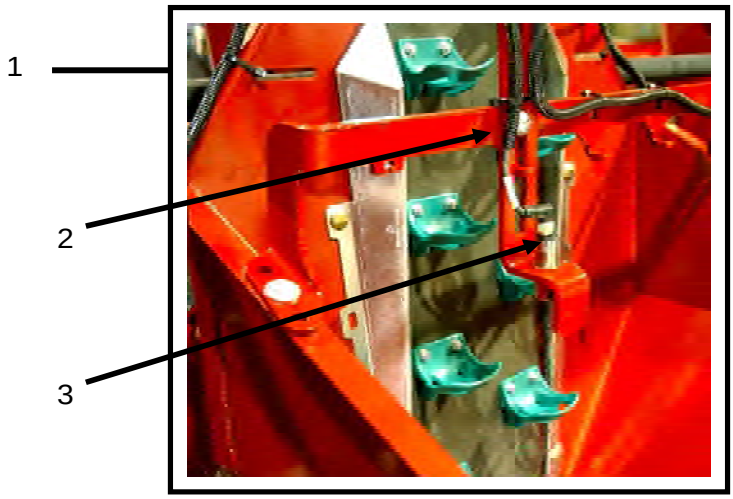
On a mechanical drive planter it can be adjusted with the flow control on the tractor valve. This speed should not be too fast to throw potatoes at the belt. However it must be fast enough to keep the seed bin full.

**Seed Bin Level –**

Before adjusting the row unit itself it is important to set the level of the seed bin (1). There are two ways to do this:

1. Loosen the carriage bolt (2) on the sensor bracket and slide the sensor to the desired position.

2. With a small screwdriver tighten or loosen the adjusting screw (3) located on the sensor itself. This changes. The “seeing” distance of the sensor. This screw is located on top of the sensors with plastic connectors and on the side of the barrel of the sensors with the metal connectors.




The level of the seed bin is critical. There must be enough seed in the bin so that there are no skips as the cups come out of the potatoes. If this level is too high it is difficult to shake off all of the doubles.

**Note: This bin level greatly effects how the shakers and the belt react. If you change this level you will have to adjust the shakers.**

**Shaker Frequency –**

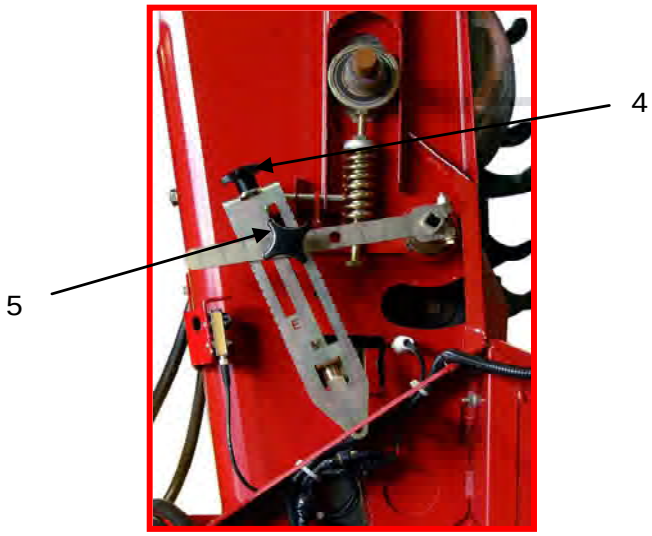
The hydraulic shaker options offer a high frequency vibration to the belt and cups. This frequency is adjustable from ~0 to 2100 Hz. A good starting point is about 50-60% of the maximum shake. This is adjusted on the optional hydraulic shakers by, using the Tractor’s Remote Hydraulic Valve . On Mechanical Planters it is set Manually on the side of each Row Unit (see **Shaker Position)**

## Configuration and Functions of the Planter

### Row Unit Set-Up

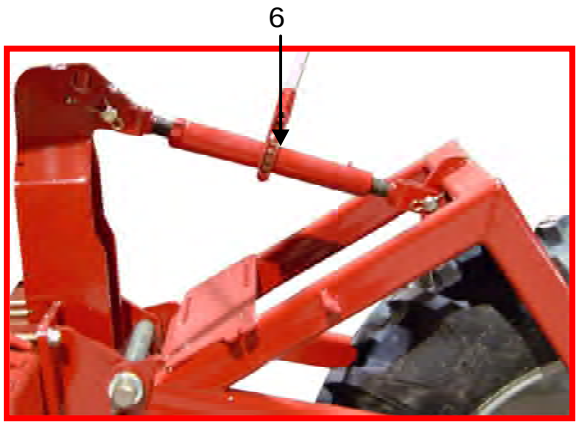
**Shaker Position –**

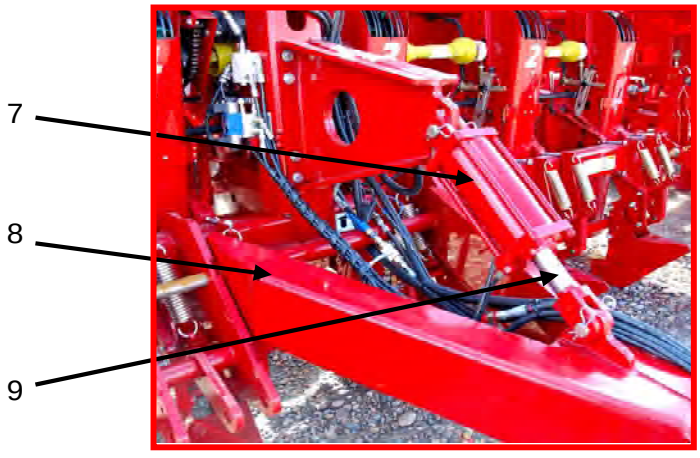
The position of the shaker is the most effective adjustment when trying to change the shake for different seed and different conditions. There is a coarse adjustment knob (4) and a fine adjustment knob (5). A good starting point is to loosen the coarse adjustment and with the shaker on let it move to a stabilized point. Tighten the course adjustment and with the shaker on let it move to a stabilized point. Tighten the course adjustment and them move the shaker in (more shake) or out (less shake) depending on seed cut and the planting speed. Turning the fin adjustment knob (5) clockwise will add more shake.




**Seed Depth –**

The seed depth is controlled by controlling the depth of the front of the planter. On a planter with front depth wheels this is done by adjusting the turnbuckles (6) on the depth wheels. On a drawbar style planter ( with no depth wheels ) the depth is controlled with the drawbar cylinder (7) on the drawbar, (8) and Cylinder Stops ( 3/4" to 2" in ¼" increments ) placed around the shaft (9) to achieve proper depth. There is also a small gage wheel attachment available that controls two rows independent of the others. This is a mechanical linkage adjustment.



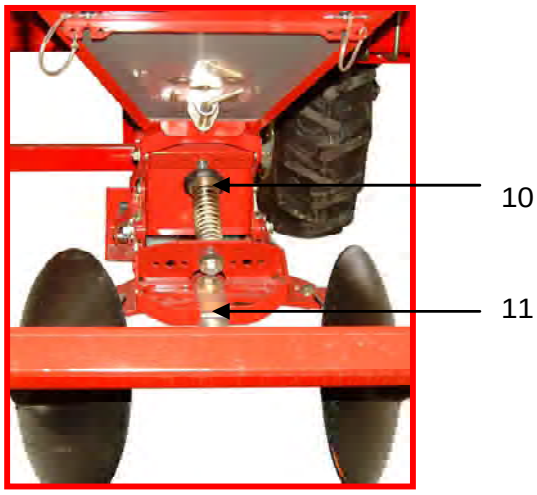



## Configuration and Functions of the Planter

### Row Unit Set-Up

**Covering Disks –**

The down pressure on the discs is controlled by tightening the spring with the adjustment knob (10). For a wider hill, remove the bolts and slide each disc assembly out from the center. The angel of the discs can also be changed by moving the disc assembly to another hole combination. A fine adjustment can be made by adjusting the rear adjustment bolt (11). Tighten all bolts after final adjustments are made.




**Seed Spacing –**

Seed spacing is set on a mechanical drive planter by changing the ratio of the front (12) and rear (13) sprockets on the front drive of the planters. A chart (A) is located inside the shield. Note, this Chart is only a guide . Seed spacing and depth will vary with Soil conditions and Planter setup.

## Configuration and Functions of the Planter

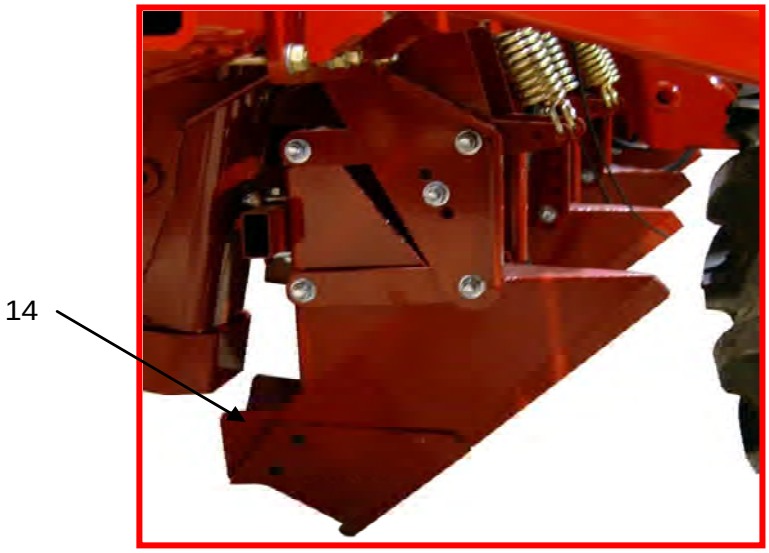
### Row Unit Set-Up

**Seed Accuracy –**

To achieve more accurate seed spacing it is critical to control seed roll. Adjustable wings (14) have been mounted on the inside of the shoe which move in and out according to soil conditions.

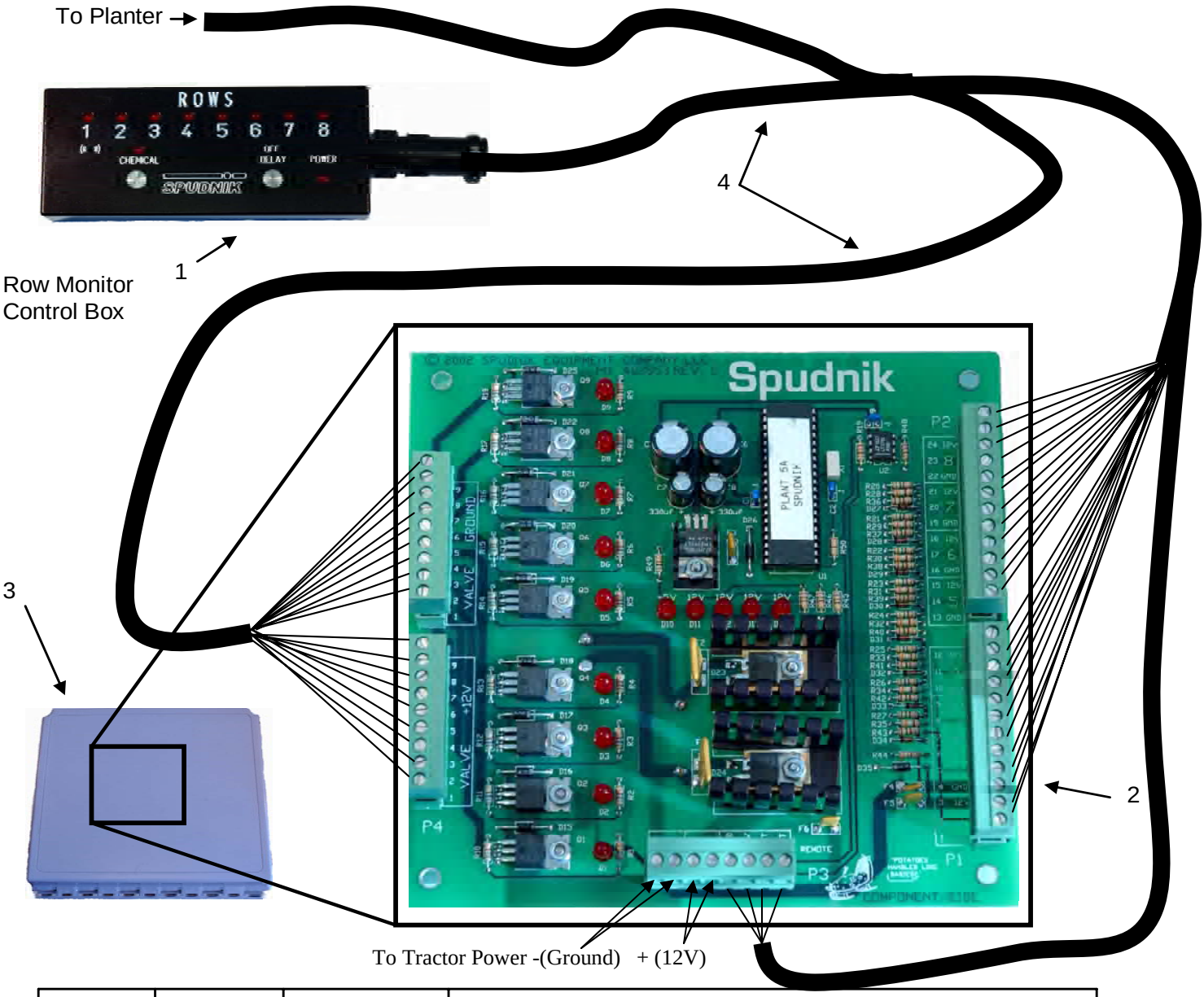
The goal is to try to pin the seed as it falls into the furrow. If the soil wraps too soon the seed depth will vary, as there is loose soil underneath the seed. If the wings are back too far the seed has an opportunity to roll, resulting in improper spacing and bunching .

Soil conditions must be monitored closely in order to achieve accurate seed spacing and depth .



## Parts Breakdown

The following diagram shows how the Row Monitor Control Box is connected to the PCB Processor.




| Item # | Quantity | Part # | Description |
|---|---|---|---|
| 1 | 1 | 450152 | PLANTER DISPLAY COMPLETE |
| 2 | 1 | 402553 | PCB PLANTER MACHINE 3 WIRE |
| 3 | 1 | 402366 | ENCL,10Wx12Hx6D A-12106CHQRFG |
| 4 | 1 | 402760 | W-HARNESS,8040/8060-LOW-05-CURRENT |
| or | 1 | 402761 | W-HARNESS,8080-EXT-LOW-05-CURRENT |

**Basic Operation**

The Spudnik Planter takes seed from the large seed bin, across a hopper fill chain, which fills the small hopper and keeps it at an optimum level. The planting cups pull the seed from this small hopper to plant the seed. The small hopper has a computer controlled monitoring system that controls the hopper fill chain to keep the seed level constant in the small hopper. The monitoring system output is displayed on the cab control box. The cab control box can be programmed for different delay times to accommodate different row space or tractor speed.
The ON DELAY or on time is the time the hopper fill chain runs before an alarm sound. If the mechanism is allowed to run because of a stuck seed piece, or other problem, the seed may overflow the small hopper, and spill seed on the ground.
The OFF DELAY or off time is the time the hopper fill chain is off. If a stuck seed piece or other problem appears, and the chain is not allowed to run, the hopper will empty and a skip will be the result.

**Timing Setup**

1.The control box monitors the action of the planter, and reports when ON or OFF parameters are exceeded.
It reports on the two important issues:
A.If the hopper fill chains have been off too long.
B.If the hopper fill chains have been running too long.
Several delay times can be set into the control box, to allow for seed size, space between seed, or speed of the tractor, to alert you of the possible problem of running too long, or off too long. (see chart 1 below)
1.A simple push and release of the "DELAY" button will change the delay times to the next longer delay and will be displayed with lights labeled 1 - 8. Note that when the 8 delay is reached, the next press of the "DELAY" button will wrap around to the 0 delay with no lights on. To view which delay you are on, push the "DELAY" button, hold the button until you read which light is on and then release it. The value will be stored in permanent memory, but may be changed as above.
The available delays are listed below with the corresponding light. (see chart 1 below)
A.The “off” time delay will turn on the row light of the row with a problem, and an audible alert tone will sound. The tone will last for two seconds and then go off. The light stays on until the problem is corrected.
B.The “on” time delay will flash the row light of the row with a problem, and an audible alert tone will sound. This will continue until the problem is corrected.
Chart 1

| Display Light | On Delay in Seconds | Off Delay in Seconds |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 4 | 40 |
| 2 | 4 | 45 |
| 3 | 4 | 50 |
| 4 | 6 | 55 |
| 5 | 6 | 60 |
| 6 | 8 | 65 |
| 7 | 8 | 75 |
| 8 | 8 | 80 |

**Row Setup**

3. To set up cab display for the 4, 6, or 8 row planter, (see chart 2):

A.Before power is applied to the unit, push down and hold the ”CHEMICAL" button and the “DELAY" button, and then apply power to the unit. After power is applied to the unit, release the buttons, one of the 8 row lights will be on showing what the planter is set for. Either 4, 6, or 8 will show a 4 row, 6 row, or 8 row planter.

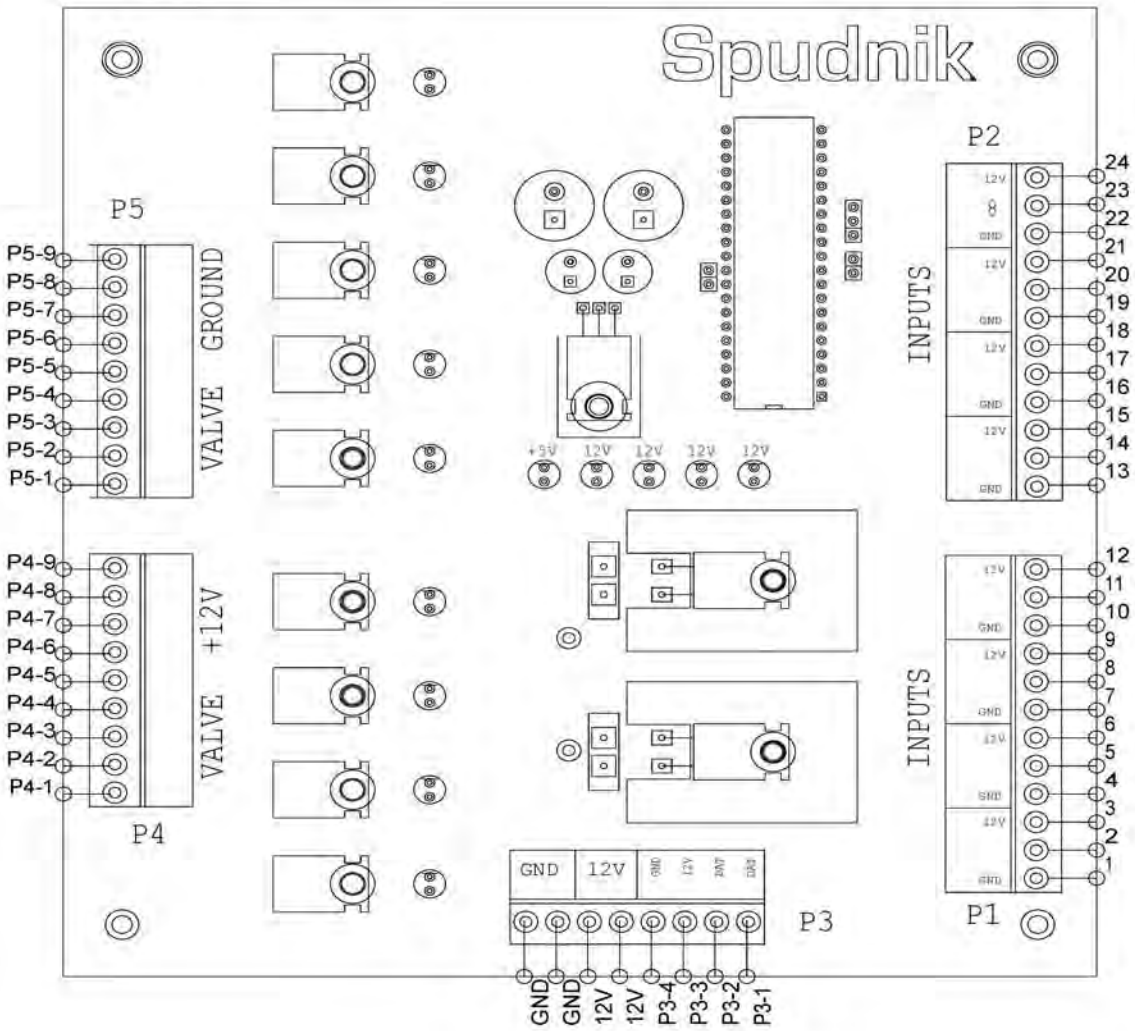
B.To change from the current setting, push and hold the delay button. The lights will change to the next higher position, such as from 4 to 6, or 6 to 8, or from 8 wraps around back to 4. Each push will advance the lights one position. If the light is on the number desired, release the "DELAY" button and push the "CHEMICAL" button. The number you have selected is stored in permanent memory, but may be changed as above if needed.

Chart 2:

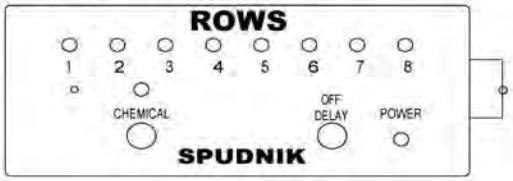
| Rows Planting | Display Light |
|---|---|
| 4 | 4 |
| 6 | 6 |
| 8 | 8 |

4 Rows Displayed

-PCB1
450130




450152




CABLE HARNESS
402760 W-HARNESS,8040/8060-LOW-05-CURRENT
402761 W-HARNESS,8080-EXT-LOW-05-CURRENT

LOW COST CONTROL TERMINAL

**402760**
**402761**

## Point 2 Point Connection List

| INPUTS | | | | | | |
|---|---|---|---|---|---|---|
| wire label | AWG | wire color | Description | FUNCTION | Pin | Connector |
| P1-1 | 18 | orange | Bin Sensor 1 | Signal | 4 | M12x1 |
| P1-2 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-3 | 18 | orange | Bin Sensor 2 | Signal | 4 | M12x1 |
| P1-4 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-5 | 18 | orange | Bin Sensor 3 | Signal | 4 | M12x1 |
| P1-6 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-7 | 18 | orange | Bin Sensor 4 | Signal | 4 | M12x1 |
| P1-8 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-9 | 18 | orange | Bin Sensor 5 | Signal | 4 | M12x1 |
| P1-10 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-11 | 18 | orange | Bin Sensor 6 | Signal | 4 | M12x1 |
| P1-12 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-13 | 18 | orange | Bin Sensor 7 | Signal | 4 | M12x1 |
| P1-14 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| P1-15 | 18 | orange | Bin Sensor 8 | Signal | 4 | M12x1 |
| P1-16 | 18 | red | | Power | 1 | |
| GND | 18 | black | | GND | 3 | |
| | | | | | | |

## Point 2 Point Connection List

| INPUTS | | | | | | |
|---|---|---|---|---|---|---|
| wire label | AWG | wire color | Description | FUNCTION | Pin | Connector |
| P4-1 | 18 | White | Feed Chain 1 | Out | 1 | DIN PLUG |
| P5-1 | 18 | White | | GND | 2 | |
| P4-2 | 18 | White | Feed Chain 2 | Out | 1 | DIN PLUG |
| P5-2 | 18 | White | | GND | 2 | |
| P4-3 | 18 | White | Feed Chain 3 | Out | 1 | DIN PLUG |
| P5-3 | 18 | White | | GND | 2 | |
| P4-4 | 18 | White | Feed Chain 4 | Out | 1 | DIN PLUG |
| P5-4 | 18 | White | | GND | 2 | |
| P4-5 | 18 | White | Feed Chain 5 | Out | 1 | DIN PLUG |
| P5-5 | 18 | White | | GND | 2 | |
| P4-6 | 18 | White | Feed Chain 6 | Out | 1 | DIN PLUG |
| P5-6 | 18 | White | | GND | 2 | |
| P4-7 | 18 | White | Feed Chain 7 | Out | 1 | DIN PLUG |
| P5-7 | 18 | White | | GND | 2 | |
| P4-8 | 18 | White | Feed Chain 8 | Out | 1 | DIN PLUG |
| P5-8 | 18 | White | | GND | 2 | |
| P4-9 | 18 | White | Chem. Clutch | Out | | Spades |
| P5-9 | 18 | White | Chem. Clutch | GND | | |
| | | | | | | |
| **SUPPLY** | | | | | | |
| 12V | 12 | RED | | Power | | RING Terminal |
| GND | 12 | BLACK | | Power | | RING Terminal |

# Notes!